HW 0

Q1) (a) $f(x) = x^3 + 2x$
$g(x) = 7x^2 - 5x + 3$

$$\lim_{x\to\infty} \frac{x^3+2x}{7x^2-5x+3} = \infty$$

so $f(x)$ grows faster (1)

(b) $f(x) = x^7 - x^5 - x^3 - x$
$g(x) = x^6 + 2844x^5 - x^4 + 273x^3$

$$\lim_{x\to\infty} \frac{f(x)}{g(x)} = \infty$$

so $f(x)$ grows faster (1)

(c) $f(x) = x^4$
$g(x) = 4x^4 + x^3$

$$\lim_{x\to\infty} \frac{f(x)}{g(x)} = \frac{1}{4} < 1$$

so $g(x)$ grows faster (2)

Q2) (a) $\log_2(x) = 8 \qquad x = 2^8 = 256$

(b) $\log_5(x) = \log_5(2) + 25 \qquad x = 5^{\log_5(2)+25}$

or

$\log_5(x) - \log_5(2) = 25$
$\log_5\left(\frac{x}{2}\right) = 25$

$x = (2)\,5^{25}$

(c) $x = \log_4(32) = \frac{5}{2}$

Q3) greetings[0] = Howdy
greetings[1] = Hello
greetings[2] = Hey